

Radioactive Material Transport in Oregon 2009-2010

Report to the 76th Legislative Assembly



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OREGON
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Radioactive Material Transport in Oregon

Report to the
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Cover photo: a truck carrying transuranic waste from Hanford to a disposal site in New Mexico climbs up Cabbage Hill just east of Pendleton, Oregon.

Report Overview

As required by Oregon Revised Statute 469.617, the Oregon Department of Energy (ODOE) prepares and submits this report to the Governor for transmittal to the 76th Legislative Assembly, regarding radioactive material transported in and through Oregon. The following report covers 2009-10 and also recaps *Oregon's Radioactive Material Transport Safety Program*.

Radioactive Material Transport Safety Program

The 1981 Oregon Legislature passed ORS 469.603 through ORS 469.621 to regulate transport of radioactive material. Oregon's rules, which are consistent with federal safety standards, mandate that the state have an effective emergency response to transport mishaps.

Oregon's Radioactive Material Transport Safety team helps to prevent accidents and prepares for and handles potential mishaps if they occur. ODOE, as the lead agency for the program, partners with other state and local agencies to carry out the program's mission.

Over the past two years, ODOE permitted carriers to transport 939 shipments of radioactive material in Oregon. The number of shipments is typical and represents a wide range of materials and hazards. Oregon had no transport accidents, spillage or injury from radioactive material during that time. There were, however, two minor traffic accidents involving radioactive material shipments explained on page six under "Transportation Accidents."

Certain shipments of radioactive material [contingent on radiation levels and if the vehicle is used to haul other material...] require warning signs called "placards." Oregon requires carriers of radioactive placarded shipments to obtain a state permit prior to transporting through Oregon. ODOE is the designated permitting authority, however, delegates this authority to the Oregon Department of Transportation (ODOT).

ODOT operates the state's ports-of-entry and can ensure that placarded carriers comply with permitting regulations. Carriers pay a fee for each placarded shipment that travels through the state—\$70.00 for most shipments and \$500 annually for some medical and industrial shipments. The fees help support the program.

Oregon requires that carriers transport hazard materials on the safest routes. The Public Health Division (PHD) manages the state's *Radiation Emergency Response Team* and works with ODOE on training and emergency planning along these routes.

The Oregon Energy Facility Siting Council (Siting Council) has rulemaking authority and develops rules to implement transport statutes that include:

- **Set requirements for notification; record keeping; reporting; packaging; and emergency response.** Require notification for inspection of certain radioactive material shipments and notification to the state of any vehicle accidents, loss of any radioactive material, tampering or obstruction of any shipments.

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- **Specify conditions of transport for certain classes of radioactive materials.** Require motor vehicles to avoid movement during a road condition advisory unless vehicles have traction tires or devices. The ODOE Director may halt the transport of radioactive material if he/she believes there is a clear, immediate danger to public health or safety. ODOE may impose civil penalties for violation of rules.
- **Establish requirements for insurance, bonding or other indemnification.** Require carriers to maintain a certain amount of insurance and pay for costs associated with response to an accident and indemnifies the State from claims arising from the release of radioactive material during transportation.

Shipment Activity

Carriers transport radioactive materials on Oregon's highways daily. They transport low amounts for industry and medicine and routinely transport industrial gauges with radioactive sources to work sites throughout the state. Many of these shipments do not require placards.

Shipments that do require placards (and a permit) include truckloads of radioactive waste shipped to and from Hanford and to nearby facilities in Washington state. Nuclear waste cleanup, other activities at Hanford and across the country often result in shipment of radioactive materials through Oregon. While most of these materials pose a low risk, some present unique hazards.

Figures 1 and 2 at the end of this report feature the number of placarded radioactive material shipments transported through Oregon from 1982-2010, including a list of shipment routes during 2009-10.

Low-level waste and materials

Low-level waste shipments traditionally contain a large majority of placarded radioactive material shipments that travel through Oregon. Both government and commercially-generated waste is buried on the Hanford site. For decades, low-level waste generated at the U.S. Department of Energy (DOE) nuclear weapon production and research sites across the country was shipped to government burial trenches at Hanford. Due to litigation, DOE agreed to suspend most shipments until environmental studies were performed.



A radioactive material shipment is parked near La Grande while the driver waits for road conditions to improve

Low-level waste from hospitals, nuclear power plants and universities in 11 Western and Rocky Mountain states, including Oregon, is buried in a commercial disposal site at Hanford operated by US Ecology, Inc. An increasing amount of low-level waste is also treated at Perma-Fix Northwest, a commercial facility near Hanford.

Fuel for nuclear reactors is fabricated at the Areva facility in Richland, Wash. Trucks carrying Areva-related raw materials and finished products travel through Oregon.

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Transuranic waste

DOE is disposing of transuranic waste—lab equipment, tools, rubble, and sludge tainted with small amounts of plutonium and other radioactive materials—by burying it at the Waste Isolation Pilot Plant (WIPP) in southeast New Mexico.

Shipments from Hanford to WIPP began in July 2000 and increased significantly. From September 2008 to March 2010 there were no shipments because DOE focused on shipping from other sites. Oregon restricts WIPP bound shipments to Interstates 82 and 84 in Northeast Oregon.

Beginning in 2010, Hanford began transporting shipments of transuranic waste to the Idaho National Laboratory for repackaging, before sending it to WIPP. These shipments travel along the same routes in Oregon as WIPP bound shipments.

Number of WIPP or Idaho-bound shipments from Hanford:

2000	5	2006	79
2001	5	2007	75
2002	3	2008	51
2003	48	2009	0
2004	66	2010	113
2005	100		

Through January 15, 2011, WIPP accepted 9,207 shipments from 10 DOE sites – with 492 of these shipments from Hanford. An additional 53 shipments of transuranic waste traveled from Hanford through Oregon to the Idaho National Laboratory.

Oregon worked with other Western states and DOE to develop and implement a comprehensive transport safety program for the shipments. The program includes:

- higher standards for the drivers and trucking companies
- a “defect-free” standard for inspections
- procedures to keep the trucks off the road when weather conditions are especially hazardous
- training of first responders and hospital emergency room personnel along the shipping routes
- advance notice of shipments provided to the states, and
- near-real time tracking of the shipments through the use of satellite tracking systems.

DOE also agreed to these above-regulatory protocols for certain other shipments.

Other shipments

In June 2009, a reactor core from the research reactor at Oregon State University was transported by truck from Corvallis to the Idaho National Laboratory.

Naval nuclear reactor compartment shipments

Since 1986, the United States Navy disposed of 122 reactor compartments from deactivated nuclear submarines and cruisers at Hanford. The Navy removes the irradiated nuclear fuel from the reactors by cutting out a section of the submarine or cruiser containing the reactor compartment and welds

steel plates over any openings to seal the compartments. The compartments are considered low-level waste, and are shipped by barge along the Columbia River and disposed of at Hanford.

Through most of the 1990s and into the early part of the 2000s, the Navy averaged between seven and 10 shipments per year. The current number of shipments averages between zero and two a year: two compartments were shipped in 2009 and two in 2010.

The Washington State Department of Health and the *Radiation Protection Services (RPS)*, a program of Oregon Public Health Division's Office of Environmental Public Health, periodically inspect the shipments prior to departure to ensure they meet state and federal transport regulations. Oregon inspected one shipment each in 2009 and 2010.

Summary of Transport Accidents and Incidents

Oregon had no transport accidents, resulting in spillage or injury from radioactive material, during the two years covered in this report.

RPS received and responded to a total of 129 incident reports: 64 in 2009, 65 in 2010. Reports included informational notifications and requests for a physical response by the emergency response team. Of the total incident reports, 47 potentially involved radioactive byproduct material transported along public roadways.

Below is a breakdown of the major categories.

Transportation accidents: 2

In March 2009, a truck hauling low-level waste (metal piping and other waste), traveling from the Puget Sound Naval Shipyard to a waste treatment facility in Tennessee, was rear-ended by a vehicle traveling south on Interstate 82 near Hermiston. State police noted minor damage to the trailer—there were no injuries—so the truck was able to continue transport. The police cited the driver, who rear-ended the trailer, for reckless driving.

In July 2010, RPS teamed with the Eugene Hazmat Team on an incident, in which a single car crash caused a moisture density gauge (which contains radioactive material) to eject from the vehicle. RPS confirmed that the gauge was intact based on radiation readings conducted by Hazmat. A Hazmat representative took possession of the gauge.

Waste monitor alarms: 23

Transports of medical radioactive byproduct material and other radioactive waste were erroneously taken to waste receiving sites that included Covanta waste-to-energy incinerator near Salem and Portland Metro waste transfer stations. RPS investigates when radioactive sensor alarms are activated. The waste was either transported back to the original shipping facility for appropriate disposal, or placed into the RPS storage facility to allow for radioactive decay. Articles retrieved included a World War II aircraft panel with radium paint on the indicator dials, bottles of thorium nitrate and 18 tritium exit signs.

Scrap monitor alarms: 19

Naturally occurring radioactive material in scrap iron, which is used to develop new metals, set off steel mill sensor alarms. RPS investigated and identified the isotope which had to be transported back to the sending facility for appropriate disposal.

Theft or loss of material: 1

An investigation, prompted by missing laboratory equipment containing byproduct material, is ongoing.

Compliance and the Effectiveness of Enforcement Activities

Oregon has experienced few compliance problems with radioactive material transports since the program began in 1981. Carriers met state standards, applied for and carried permits, and paid their fees.

Inspections both within the state and nationally confirm that, on average, trucks carrying radioactive materials are better maintained than trucks carrying other hazardous materials.

Future Shipments

Low-level waste

Carriers will continue to transport low-level waste shipments through Oregon to Hanford and to and from Richland area facilities—shipment numbers are difficult to predict.

During the next few years, Oregon is unlikely to see major, new shipping campaigns associated with Hanford. In 1999, DOE chose Hanford as a primary disposal site for significant amounts of the nation's low-level and mixed low-level waste. Because of this, Hanford could have received thousands of shipments for many years but litigation prevented DOE from allowing this to happen. A separate litigation settlement extends the moratorium on most waste shipments to Hanford through 2022.

Shipments to the US Ecology Inc. disposal site, as well as to and from Perma-Fix and Areva facilities, will continue.

Transuranic waste

Hanford has large quantities of transuranic waste to dispose of at the WIPP site. Hanford's funding challenges may delay most of these shipments for a few years, but both Idaho and WIPP expect to receive some shipments from Hanford in 2011.

Hanford expects to limit shipments of "remote-handled" transuranic waste. All transuranic waste shipments from Hanford so far have been of "contact-handled" waste, which has very little penetrating radiation. Remote-handled waste does contain penetrating radiation and requires heavy lead shielding in the transport container. The lead shielding reduces the amount of waste than can be carried in each shipment.

Naval nuclear reactor compartment shipments

In 2011 and looking ahead, shipments of submarine and cruiser reactor compartments will continue along the Columbia River. There will be a limited number of shipments each year as there were in recent years.

Spent nuclear fuel and high-level waste

The federal government cancelled plans to build and operate a geologic repository in Nevada to dispose of the nation's spent nuclear fuel and high-level nuclear waste. Their decision could potentially leave highly radioactive waste in the states of Oregon and Washington for years. Irradiated nuclear fuel is stored at the Trojan nuclear power plant (shut down in 1993) northwest of Portland and at the Columbia Generating Station nuclear plant near Richland. Highly radioactive waste, stored at Hanford, will be moved to a geologic repository once such a facility is sited and built. These materials could be transported through Oregon for disposal. Before transport could occur, extensive planning and training would be primary regardless of where the government decides to locate the facility.

Emergency Preparedness and Response Activities

ODOE contracts with RPS to provide radiological training to first responders and hospital emergency room personnel. Approximately 830 people statewide received the training during the two years covered by this report. Additional training was provided by other state and local agencies.

ODOE also contracts with Oregon State University's *Radiation Center* to offer, annually, members of Oregon's regional Hazardous Material Response Teams advanced training in radiological response. In addition, state police officers and emergency responders from other state, federal and local agencies participate in the training. About 25 people received the training each year.

Public Information/Regional Planning

ODOE employees participated in a number of regional and national forums to help develop transportation policies consistent with Oregon policy. They include:

- The Western Governors' Association Technical Advisory Group for WIPP Transport
- The Western Interstate Energy Board's High-level Radioactive Waste Committee
- State and Tribal Government Working Group
- The National Transportation Stakeholder's Forum

The *Oregon Hanford Cleanup Board*, a policy advisory group to the governor, legislature and ODOE on Hanford issues, stays abreast of radioactive material transport issues.

For additional information refer to the ODOE website: Oregon.gov/ENERGY/NUCSAF/index.shtml

Recommendations for Additional Legislation

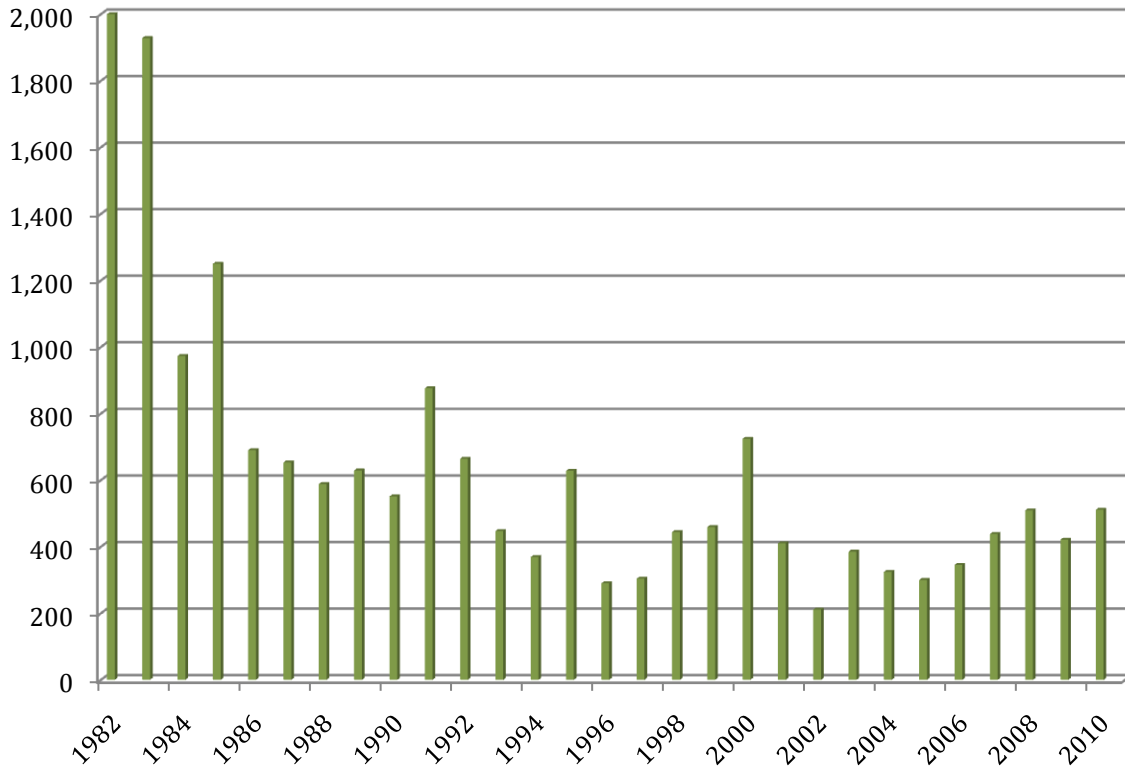
At this time, ODOE has no recommendation for additional legislation that would enhance the program or improve public safety.

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Figure 1:

Placarded radioactive material shipments through Oregon

YEAR	SHIPMENTS	YEAR	SHIPMENTS	YEAR	SHIPMENTS
1982	2,000+	1993	447	2004	324
1983	1,928	1994	369	2005	300
1984	973	1995	628	2006	345
1985	1,250	1996	290	2007	438
1986	690	1997	304	2008	509
1987	653	1998	444	2009	421
1988	588	1999	459	2010	518
1989	629	2000	724		
1990	551	2001	410		
1991	876	2002	211		
1992	664	2003	385		



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Figure 2
Placarded radioactive shipments by route - 2009

	Interstate 5 thru state	Interstate 5 Portland to Eugene	Interstate 84 Columbia Gorge	US Highway 97	Interstate 84 Eastern Oregon	Total
January	3	6	2	0	15	22*
February	0	6	0	0	15	21
March	5	0	7	4	42	42*
April	0	5	1	1	27	33*
May	1	0	1	1	43	45*
June	6	5	5	4	37	43*
July	0	2	1	1	41	43*
August	2	1	3	2	48	49*
September	1	0	0	0	28	29
October	1	1	1	1	37	40*
November	0	0	1	0	34	34*
December	1	1	1	1	18	20*
Total	10*	27*	23*	15*	383*	421*
Percent	2%	6%	5%	3%	91%	

Placarded radioactive shipments by route - 2010

	Interstate 5 thru state	Interstate 5 Portland area/ to Eugene	Interstate 84 Columbia Gorge	US Highway 97	Interstate 84 Eastern Oregon	Total
January	1	0/4	7	3	30	38*
February	1	3/3	0	0	42	49
March	0	5/4	1	3	34	46*
April	0	4/9	1	0	35	49
May	3	4/8	6	1	43	59*
June	1	4/4	1	0	28	37*
July	1	3/2	1	1	23	30*
August	3	1/4	0	0	41	51*
September	0	8/11	0	0	16	35
October	1	5/3	1	0	32	42
November	0	7/7	0	0	22	36
December	0	3/4	0	0	39	46
Total	11*	110	18*	8*	385*	518*
Percent	2%	21%	3%	1%	74%	

** Some shipments show up on more than one route.*